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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/729,088	12/05/2000	Mitsuaki Furumoto	400966	3275

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EXAMINER

THOMPSON, ANNETTE M

ART UNIT PAPER NUMBER

2825

DATE MAILED: 01/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/729,088

Applicant(s)

FURUMOTO ET AL.

Examiner

A. M. Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Applicants' Response to Office Action to 09/729,088 has been examined. The specification and title are amended. Claim 6 is cancelled. Claims 1-4 are amended. Claims 1-5 are pending.

1. This second Office Action on the merits is partially based on Applicants' amendments and applies prior art that more closely reads on Applicants' claims as amended. Further, Applicants state that Applicants' Response to Office Action includes Drawing Amendments to Figure 9. However, then PTO file wrapper contains no record or copies of drawing amendments.

Specification

2. The disclosure is objected to: The abstract requires revision for standard narrative English and phraseology. For example, in line 2, before "delay gates", delete -a- -; at line 3, change "onto" to -into- -.; the third sentence requires revision for clarity.

Appropriate correction is required.

Drawings

3. The drawings are objected to because at Figure 9, decision step S105, the output of one decision (i.e. the OK line) is unconnected. Additionally, it is unclear what "NG" means. At Figure 5, #S32 and Figure 8, #S72, the phrase that begins with "collectively" needs revision with attendant punctuation for clarity. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

4. **Claims 4 and 5** are objected to because of the following informalities: Pursuant to **claims 4 and 5**, at line 2, before "trees", insert - -clock- -. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. **Claims 1-5** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Pursuant to **claim 1**, at line 8, "some" renders this claim indefinite because the metes and bounds of this word is unclear (i.e., how much is some?). Pursuant to **claims 4 and 5**, the relation between *stages*, *delay gates*, and the *semiconductor circuit* is unclear. Additionally, pursuant to claims 4 and 5, the relationship between the phrase *targets to be deleted* and the rest of the claim requires clarification. Pursuant to **claims 2 and 3**, it is unclear what Applicants mean by "collectively placing a plurality of delay gates", and Applicants specification does not clarify this point, i.e. does this mean that Applicants place a plurality of gates simultaneously. Also, pursuant to **claim 3**, a lack of structural/functional relationship exists between the phrases "placing a plurality of delay gates in a region free of lines" and "so that clock lines are not influenced by other lines". Examiner suggests that the inclusion of a recitation that the delay gates are inserted

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into the clock lines either in the independent claim or in claim 3 would be helpful in forming the relationship.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Rejection of Claims 1-5

10. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al., U.S. Patent 5,974,245. Li discloses a method for making integrated circuits by inserting buffers into clock trees of a circuit described by a netlist. Li does not explicitly disclose the deletion of inserted delay gates (buffers) based on timing constraints between clock trees. However, Li includes a step of moving buffers to locations permitted by design specifications (col. 13, ll. 8-11; Fig. 9, # 214). The act of moving

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buffers from one location to another is a form of deletion; the process of deletion involves the absence or elimination of something by a particular means. In Li, the deliberate movement of the buffers from one location to another necessitates the elimination or deletion of a buffer from one location before placement in another. Therefore, Li's movement of buffers at least suggests the deletion of inserted delay gates, and this would have been obvious to one of ordinary skill in the art at the time of Applicants' invention.

11. Pursuant to claim 1 which recites [a] method of designing a semiconductor circuit having clock trees (col. 2, ll. 63-67, Li discloses a method of making integrated circuits involving clock trees) comprising generating a netlist (col. 3, ll. 3-6); inserting a plurality of delay gates into said netlist (col. 3, ll. 5-10); placing said netlist to produce a circuit placement (col. 4, ll. 43-47); generating clock trees for said circuit placement that satisfy a timing constraint (col. 5, line 61 to col. 6, line 14); routing said netlist after generation of said clock trees (Fig. 4, #66; col. 6, ll. 47-55); manually adjusting skew between said clock trees by deleting said delay gates based on the timing constraint between said clock trees (col. 8, ll. 15-29); examining the skew between clock trees (col. 7, ll. 49-61); determining whether the timing constraint is satisfied (col. 8, ll. 15-22); and making a minimum change in the placing and routing when said delay gates are inserted (col. 6, ll. 47-58).

12. Pursuant to claim 2, wherein placing said netlist includes placing a plurality of delay gates (col. 6, ll. 36-40).

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13. Pursuant to claim 3, wherein placing the netlist includes placing a plurality of delay gates in a region free of lines, other than clock lines (col. 6, ll. 36-46).
14. Pursuant to claims 4 and 5, wherein in manually adjusting skew between trees, certain delay gates are not deleted (col. 8, ll. 15-29).

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please reference the PTO-892 for a complete listing.

- Soboleski et al., U.S. Patent 5,691,662, discloses a method for minimizing clock skew integrated circuits.
- Li et al., U.S. Patent 5,638,291, discloses a method and apparatus for making integrated circuits by inserting buffers into a netlist to control clock skew.

16. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to A.M. Thompson whose telephone number is (703) 305-7441. The Examiner can usually be reached Monday thru Friday from 8:00 a.m. to 5:00 p.m.. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Matthew S. Smith, can be reached on (703) 308-1323.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956 or the Customer Service Center whose telephone number is (703)306-3329.

17. Responses to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

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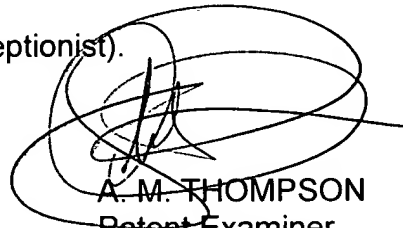
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or faxed to:

(703) 872-9318, (for **OFFICIAL** communications intended for entry)

(703)872-9319, (for Official **AFTER-FINAL** communications)

Hand-delivered responses should be brought to Crystal Plaza 4, 2021 South Clark Place, Arlington, VA., Fourth Floor (Receptionist).



A. M. THOMPSON
Patent Examiner

20 December 2002